

Versatility of Pectoralis Major Myocutaneous Flap for Reconstruction of Large Oral Cavity Defects

MAHMOUD ABDEL AZIZ, M.D.*; SHERIF KOTB, M.D.*; SAMEH ROSHDY, M.D.*;
NASSEF ZAHER, M.D.**; SHADY AWNY, M.D.*; ISLAM ABDO, M.D.*;
MOHAMED ABDELGHAFFAR, M.D.*; TAMER ELMETWALLY, M.D.***; ADEL DENEWER, M.D.* and
KHALED ABDELWAHAB, M.D.*

Surgical Oncology Unit, Mansoura Oncology Center, Mansoura University,
Surgery Department, Mansoura Insurance Hospital** and Anesthesia & Intensive Care Unit, Faculty of Medicine,
Mansoura University****

Abstract

Background: Oral cavity reconstruction is one of the most challenging and progressive areas in reconstructive surgery. In oral cavity reconstruction the main goals are prompt and safe restoration of mucosal integrity, avoid oro-cutaneous fistula with restoration of the bony support whenever needed, followed by restoration of the function then lastly restoration of the form (aesthetics).

Aim of Study: The aim of our study is to evaluate the feasibility of using pectoralis major muscle myocutaneous flap in reconstruction of oral cancer post excision defects.

Patients and Methods: This is a retrospective study in which sixteen patients with oral cavity malignant tumors underwent surgical excision and immediate reconstruction, during the period from July 2016 to July 2019 with pectoralis major myocutaneous flap as regard peri operative evaluation and post operative complications.

Results: This retrospective study included 16 patients with oral malignancy with reconstruction of the oral defect using pectoralis major myocutaneous flap.

The mean duration of follow-up in all patients was 13.8 months (ranged from 6 to 30 months). From 16 patients, 4 patients (25%) patients had De-novo cancers, while the rest were recurrent cases.

Conclusion: Pectoralis major myocutaneous flap is considered as an easy, simple method in cases of large oral cavity defects. It can be used as a back up or an alternative to free tissue transfer or even as salvage procedure.

Key Words: *Pectoralis major – Oral cancer – Myocutaneous flap.*

Introduction

ORAL cavity reconstruction is one of the most challenging and progressive areas in reconstructive

Correspondence to: Dr. Mahmoud Abdel Aziz,
Surgical Oncology Unit, Mansoura Oncology Center,
Mansoura University

surgery. The treatment of many cancer patients may not be completed by a single surgery and is often a lifelong process, with secondary surgery required for cosmetic reasons or rehabilitation or for management of a recurrence [1].

In oral cavity reconstruction the main goals are prompt and safe restoration of mucosal integrity, avoid oro-cutaneous fistula with restoration of the bony support whenever needed, followed by restoration of the function then lastly restoration of the form (aesthetics). These objectives can decrease postoperative morbidity, lessen the period of hospital stay and enhance patient recovery and his ability to return to his daily activities [2].

After Ariyan in 1979 has started using Pectoralis major myocutaneous flap in head and neck reconstruction, it became a key role in reconstruction of head and neck defects [3-6].

The aim of our study is to evaluate the feasibility of using pectoralis major muscle myocutaneous flap in reconstruction of oral cancer post excision defects.

Patients and Methods

This is a retrospective study done in Surgical Oncology Unit, Mansoura Oncology Center, Mansoura University in which sixteen patients with oral cavity malignant tumors underwent surgical excision and immediate reconstruction, during the period from July 2016 to July 2019 with pectoralis major myocutaneous flap as regard peri operative evaluation and post operative complications.

Surgical techniques:

- 1- Tumor excision: In which curative wide local excision with safety margin all around was performed and was confirmed intraoperative with frozen section examination for soft tissue lesions, (not bony cut margins).
- 2- Defect assessment regarding its size, depth (in centimeter), types of tissues lost (soft tissue, composite tissue).
- 3- Decision making regarding the selection of the reconstructive option depended mainly on the size and type of the defect, patient general status and presence of associated significant comorbidities which could preclude lengthy operations like free flap reconstruction.

Pectoralis major myocutaneous flap:

- 4- Patient was positioned supine flat with marking of elliptical skin island according to the size of defect needed to be reconstructed.
- 5- Incision was made deep into skin, subcutaneous fat and deep fascia to outline of skin island, then skin edges were dissected free of the muscle leaving the island attached to underlying muscle. Proceeding from below upward, the pectoralis major muscle was elevated from the chest wall (Fig. 1).



Fig. (1): Elevation of PMMF where skin edges were dissected free of the muscle leaving the island attached to underlying muscle.

Mobilization and elevation of the myocutaneous flap was done from the chest wall, serratus, and pectoralis minor preserving its nutrient vascular pedicle (Thoraco acromial artery) along with the deep muscular fascia in a superior direction towards the clavicle.

Arc of rotation may be lengthened by freeing the muscle attachments, leaving a small muscle piece to protect the feeding vessels. Closure of donor site was done primary.

PMMF was transferred to the oral defect through subcutaneous tunnel made at root of the neck. The skin island was sutured to soft tissue defect (Figs. 2,3).



Fig. (2): Insertion of PMMF in lower lip defect and Primary Closure of donor site.



Fig. (3): Post operative picture after 6 months.

Results

This is a retrospective study including 16 patients with oral malignancy with reconstruction of the oral defect using pectoralis major myocutaneous flap.

The mean duration of follow-up in all patients was 13.8 months (ranged from 6 to 30 months).

From 16 patients, 8 patients (50%) patients had De-novo cancers, while the rest were recurrent cases.

Preoperative nodal status was positive in 7 (43.8%) patients. This is explained because half of the cases were recurrent whom already have had previous neck dissection.

Table (1): Demographic data of the cases in the study.

Variables	PMMF Group
Number	16
<i>Age:</i>	
Mean ± SD	56.56±15.08
Median (range)	60 (15-81)
<i>Sex:</i>	
Male	10 (62.5%)
Female	6 (37.5%)
<i>Residence:</i>	
Urban	10 (62.5%)
Rural	6 (37.5%)
Smoking	8 (50%)
<i>Comorbidities:</i>	
DM	0 (0%)
Comorbidities	0 (0%)
Neoadjuvant chemotherapy	0 (0%)

Table (2): Pathological nature, preoperative nodal status, stage of the tumor, site of cancer and methods used for reconstruction.

Variables	PMMF Group
Number	16
<i>Pathological nature:</i>	
De novo	8 (50%)
Recurrent	8 (50%)
Preoperative LN affection	7 (43.8%)
<i>Stage:</i>	
Stage 3	6 (37.5%)
Stage 4	10 (62.5%)
Lip and/or lip commissures	1 (6.25%)
Check and/or Retro-molar trigon	5 (31.25%)
Tongue and/or Floor of mouth	3 (18.75%)
Mandible and/or alveolar Ridge	7 (43.75%)

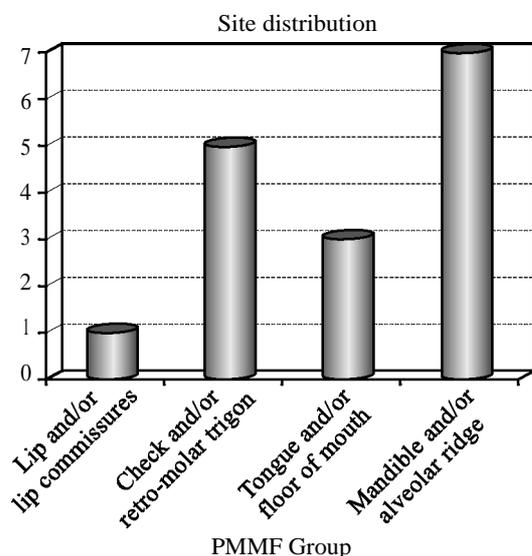


Fig. (3): Site of cancer in the studied groups.

The mean operative time 4.96 ± 1.55 hours. The mean blood loss was 525 ± 177 . Blood transfusion was needed only in 6 patient. Post resection defect ranged between 6-12cm.

Table (3): Intraoperative finding.

Variables	PMMF Group
Number	16
<i>Operative time:</i>	
Mean	4.96±1.55
Median (range)	5 (2-8)
<i>Blood loss:</i>	
Mean	525±177.01
Median (range)	600 (200-800)
<i>Resection defect:</i>	
Soft	8 (50%)
Composite	8 (50%)
Defect Range in cm	6-12
<i>Neck dissection:</i>	
MRBN	7 (43.8%)
Supraomohyoid	6 (37.5%)
Sentinel biopsy and prophylactic	1 (6.3%)
	0 (0%)

Mean hospital stay was 13.19 ± 7.41 days. Patients started fluid per NGT in 2nd day. There were 1 (2%) early postoperative death underwent PMMF (sudden arrest and died three days postoperative due to associated cardiac comorbidity).

Post-operative complications were divided as: (1) Reconstruction related complications were: Reconstruction failure (partial flap loss) in three cases that was managed conservatively by multiple dressing and secondary closure after granulation formation, (2) Recipient site complications were: Hematoma in one case, Infection and salivary fistula in one case (3) Donor site complications were: Wound infection and dehiscence in one case (4) General complications were: Chest infection in two cases, Deep venous thrombosis (DVT) in one case. Local recurrence occurred in 2 cases which were already recurrent case. Nodal recurrence occurred in 2 cases.

Discussion

Surgery for tumors of the head and neck can cause significant soft tissue, bony and skin defects. This may result in functional impairment such as speech and swallowing deficits [7,8].

Several techniques have been developed to reconstruct oral cavity in order to, improve aesthetic and functional outcomes. These are primary closure, skin grafts, local transposition of skin, mucosa and/or muscle, regional pedicled flaps and distant free (re)vascularized (free) flaps.

Up till now, there is no sure specific uniform algorithm or approach for the best method for oral cavity reconstruction.

Reconstructions using micro vascular techniques are considered the most ideal technique for reconstruction of head and neck cancer defects. Yet, it can be associated with major complications, need advanced surgical training and practice and also, not easily found in many head and neck units [9,10].

In our study, we reviewed 16 patients with oral cavity malignant tumors that was reconstructed with pectoralis major myocutaneous flap.

Pectoralis major flap is characterized by the fixed anatomy which is near to the oral cavity region and so, harvesting, covering and fixation to the recipient site can be done in a one stage operation [11].

The mean age of oral cancer in our study was 56.56 ± 15.08 and median was 60 ranging from (15-81) years. This was a bit higher than other studies [12], where the main age was 53.1 years (ranged from 41 to 69), and Ahmed Quzai and his colleagues found the mean age in their study was 49.5 years ranged from 25 years to 85 years [13].

Oral cancer, in our study, most common sites were in tongue and/or floor of mouth 3 cases (18.75%); mandible were 7 cases (43.75%); cheek and/or retro-molar trigone were 5 cases (31.25%); lip and/or lip commissures only one case (6.25%); approximating with hisng study [(27.2%); (8.8%); (58%) and (6%) respectively] [14].

The main operative time was 4.57 ± 1.68 hours in our study markedly less than hisng (11.15 ± 3.51 hours). (ranged from 2-9 hours); and mean operative blood loss 460.71 ± 173.93 ml [ranged from 200-800ml] [14].

In our study, 8 cases (50%) had soft tissue defect (skin, muscle and mucus membrane). Hisng found (45% soft; 55% composite).

The mean hospital stay in our study was (13.19 ± 7.41). It was affected by the extent of resection, the type of reconstruction and complications. Hisng and his collagues declared that the mean hospital stay was 24.7 ± 18.7 [14].

The muscle part of the flap is rich in blood which helps in maintaining integrity of flap and minimizing the rate of partial and total flap loss and, so decreasing the incidence of oral fistula from the recipient site [15]. And despite the fact

that this flap can be harvested with an easy technique and with minimal morbidity, we should care much about the possibility of donor site complications [11].

Conclusion:

The choice of oral cavity reconstruction should be carefully discussed with the patient, taking into account patient factors, comorbidity, tumor factors, prognosis, and expectations regarding functional, aesthetic and oncological outcome.

Pectoralis major myocutaneous flap is considered as an easy, simple method in cases of large oral cavity defects. It can be used as a back up or an alternative to free tissue transfer or even as salvage procedure.

To decrease the incidence of complications we recommend, good selection of patient, meticulous water tight tension free closure of mucosa, adequate haemostasis, early ambulation and anticoagulant use, endotracheal tube should not be removed unless patient is fully awake, and chest exercise.

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تقييم استخدام السديلو العضلية الصدرية الكبيرة لإعادة تشكيل عيوب تجويف الفم الكبيرة

تعد إعادة بناء تجويف الفم واحدة من أكثر المناطق صعوبة في الجراحات الترميمية. تتمثل الأهداف الرئيسية في الاستعادة والأمانة لسلامة الغشاء متبوعاً باستعادة الوظيفة ثم أخيراً استعادة الشكل.

الهدف من دراستنا: هو تقييم جدوى استخدام السديلة العضلية الجلدية الصدرية الكبيرة في إعادة تشكيل عيوب تجويف الفم بعد عمليات استئصال الأورام السرطانية.

تم دراسة ستة عشر مريضاً يعانون من أورام خبيثة في تجويف الفم لعملية استئصال جراحي وإعادة بناء فورية.

استنتاج: تعتبر السديلة الصدرية العضلية الصدرية الكبيرة طريقة سهلة وبسيطة في حالات عيوب تجويف الفم الكبيرة. يمكن استخدامها كبديل احتياطي أو بديل للنقل الحر للأنسجة.